

AIR DIFFUSING TUBE TYPE AIR DISPERSING EQUIPMENT OF FLUIDIZED BED FURNACE

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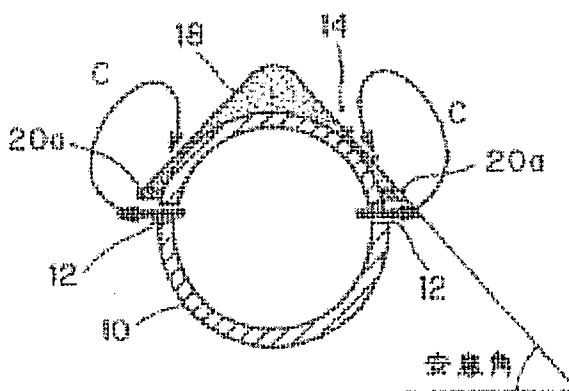
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Abstract of JP 11248109 (A)

PROBLEM TO BE SOLVED: To prevent wear of air diffusing tubes in an air diffusing tube type air dispersing equipment used for a fluidized bed furnace. **SOLUTION:** In a fluidized bed furnace, on the upper side of an air dispersing equipment made of a plurality of air diffusing tubes, a fluidized bed for fluidizing a fluidizing medium and combustible material is formed, while on the lower side of the air dispersing equipment, a charging bed made of the fluidizing medium and incombustible material falling from the fluidized bed is formed.; Wear prevention plates 20a for preventing the wear of the air diffusion tubes are provided in a horizontal direction above air blow-off holes 12 formed in sides of each air diffusing tube body 10, so as to form a still bed 18 made of the fluidizing medium which covers the upper portion of the air diffusing tube (fluidized bed side of the air diffusing tube) with the fluidizing medium.



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Family list1 application(s) for: **JP11248109 (A)****1 AIR DIFFUSING TUBE TYPE AIR DISPERSING EQUIPMENT
OF FLUIDIZED BED FURNACE****Inventor:** KAWAMURA TARO ; KUMAGAI
CHIKANORI (+1)**Applicant:** KAWASAKI HEAVY IND LTD**EC:****IPC:** F27B15/02; F23C10/20; F23G5/30; (+8)**Publication info:** JP2918110 (B2) — 1999-07-12
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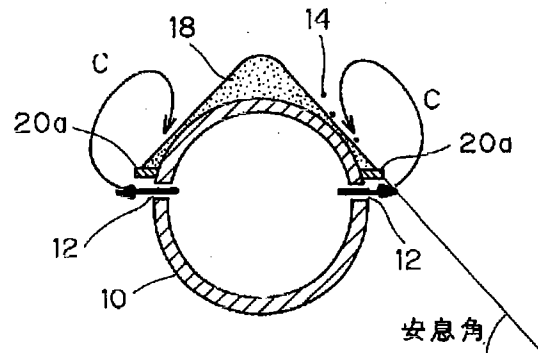
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(54) 【発明の名称】 流動層炉の散気管型空気分散器

(57) 【要約】

【課題】 流動層炉に用いられる散気管型空気分散器において、散気管の摩耗を防止する。

【解決手段】 複数本の散気管からなる空気分散器の上側に流動媒体と可燃物とを流動化させるための流動層を形成するとともに、空気分散器の下側に前記流動層から降下する流動媒体と不燃物との充填層を形成するようにした流動層炉において、散気管本体10の側部の空気吹出孔12の上側に散気管の摩耗を防止するための摩耗防止板20aを略水平方向に設け、散気管上部(散気管の流動層側)を流動媒体で被覆する流動媒体の静止層18を形成させる。



【特許請求の範囲】

【請求項1】 複数本の散気管からなる空気分散器の上側に流動媒体と可燃物とを流動化させるための流動層を形成するとともに、空気分散器の下側に前記流動層から降下する流動媒体と不燃物との充填層を形成するようにした流動層炉において、散気管の側部の空気吹出孔の上側に散気管の摩耗を防止するための摩耗防止板を略水平方向又は斜め上方向に設け、散気管上部を流動媒体で被覆する流動媒体の静止層を形成させるようにしたことを特徴とする流動層炉の散気管型空気分散器。

【請求項2】 複数本の散気管からなる空気分散器の上側に流動媒体と可燃物とを流動化させるための流動層を形成するとともに、空気分散器の下側に前記流動層から降下する流動媒体と不燃物との充填層を形成するようにした流動層炉において、散気管が上下複数段に千鳥配列状に配設されたことを特徴とする流動層炉の散気管型空気分散器。

【請求項3】 散気管が上下複数段に千鳥配列状に配設された請求項1記載の流動層炉の散気管型空気分散器。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、流動層ごみ焼却炉等の流動層炉における散気管型空気分散器に関するものであり、詳しくは、散気管本体の摩耗防止を図ることができ、また、均一で良好な流動化と大塊不燃物の排出性とを両立させることができる流動層炉の散気管型空気分散器に関するものである。

【0002】

【従来の技術】流動層ごみ焼却炉等の流動層炉においては、炉内に複数本の散気管からなる空気分散器を水平面状に一段に配設して、これらの散気管の上側に、都市ごみ、産業廃棄物等の可燃物と流動媒体とが流動化される流動層を形成させ、散気管の下側に流動層から降下する流動媒体と不燃物との充填層を形成させるようにした構造のものが知られている。上記のような流動層炉に用いられる散気管型空気分散器では、図11に示すように、散気管本体10の側部に設けられた空気吹出孔12から空気が噴出されて珪砂等の流動媒体及び可燃物が流動化するが、矢印Aのように循環する流動媒体14が散気管本体10に衝突して散気管本体10を摩耗させていた。

【0003】このような流動媒体の散気管への衝突を防止して散気管の摩耗対策を図るものとして、実開昭59-48432号公報には、散気管の管外壁に沿って流動媒体の静止層を形成させるための滞留部材を略鉛直方向に設けた構造が開示されている。実開昭59-48432号公報に記載された散気管構造は、図12、図13に示すように、散気管本体10の空気吹出孔12の上側に略鉛直方向に設けられた2枚の滞留部材16によって、流動層側の散気管本体10（散気管上部）の管外壁に流動媒体の静止層18を形成させ、流動化した流動媒体が

散気管本体10へ直接衝突しないようにして散気管本体10の摩耗防止を図るようにしたものである。

【0004】

【発明が解決しようとする課題】しかしながら、実開昭59-48432号公報に記載されたような散気管構造では、図12、図13に示すように、滞留部材16が略鉛直方向に配置されているため、静止層18の流動媒体量が多くなり、散気管本体10の管外壁上部に形成される静止層18の重量が必要以上に大きくなるという問題があり、静止層重量が大きい分、散気管の肉厚を厚くする必要があり、コストアップにもなる。また、図12に示すように、流動媒体14は矢印Bのように循環するので、流動媒体14が滞留部材16に衝突し、滞留部材16自体を摩耗させることになる。

【0005】また、流動層ごみ焼却炉等の流動層炉において、散気管を平面的に一段に配置する構成では、大塊不燃物が通り抜けられる程度に散気管配列ピッチを大きくする必要があり、散気管間隔が広がると流動媒体及び可燃物の流動化が不均一になることから、均一で良好な流動化と大塊不燃物の排出性とを同時に実現させることは困難である。

【0006】本発明は上記の諸点に鑑みなされたもので、本発明の目的は、流動層ごみ焼却炉等の流動層炉に用いられる散気管型空気分散器において、散気管上部（散気管の流動層側）の管外壁が最低限の流動媒体量で被覆されるように、散気管上部に流動媒体の静止層を形成させることにより、流動媒体が散気管に直接衝突しないようにして散気管の摩耗を防止するとともに、静止層重量を低減させて散気管の肉厚を薄くできるようにした流動層炉の散気管型空気分散器を提供することにある。また、本発明の目的は、流動層ごみ焼却炉等の流動層炉に用いられる散気管型空気分散器において、大塊不燃物が通り抜けられるように散気管配列ピッチを広くした上で、流動媒体及び可燃物の流動化が均一になるようにした流動層炉の散気管型空気分散器を提供することにある。

【0007】

【課題を解決するための手段】上記の目的を達成するために、本発明の流動層炉の散気管型空気分散器は、複数本の散気管からなる空気分散器の上側に流動媒体と可燃物とを流動化させるための流動層を形成するとともに、空気分散器の下側に前記流動層から降下する流動媒体と不燃物との充填層を形成するようにした流動層炉において、散気管の側部の空気吹出孔の上側に散気管の摩耗を防止するための摩耗防止板を略水平方向又は斜め上方向に設け、散気管上部（散気管の流動層側）を流動媒体で被覆する流動媒体の静止層を形成させるようにしたことを特徴としている（図1～図8参照）。この場合、摩耗防止板は、流動媒体固有の安息角をなす静止層によって散気管が被覆されるような最低限の長さ、あるい

は、それより若干長い長さとするのが好ましい。安息角をなす流動媒体静止層によって散気管を覆うことにより、静止層重量を大幅に低減させることができる。

【0008】また、本発明の流動層炉の散気管型空気分散器は、複数本の散気管からなる空気分散器の上側に流動媒体と可燃物とを流動化させるための流動層を形成するとともに、空気分散器の下側に前記流動層から降下する流動媒体と不燃物との充填層を形成するようにした流動層炉において、散気管が上下複数段に千鳥配列状に配設されたことを特徴としている（図9参照）。散気管を上下複数段（例えば、上下2段）に千鳥配列状に配置することにより、大塊不燃物が通り抜けられる散気管間隔を確保しつつ、流動層の均一で良好な流動化が実現できる。その詳細については後述する。上記の摩耗防止板を設けた散気管型空気分散器において、散気管を上下複数段に千鳥配列状に配設する構成とすることもできる（図10参照）。

【0009】

【発明の実施の形態】以下、本発明の実施の形態について詳細に説明する。図1～図5は、本発明の実施の第1形態による流動層炉の散気管型空気分散器を示している。本実施の形態は、散気管側部の空気吹出孔の上側に摩耗防止板を略水平方向に取り付けるようにしたものである。まず、散気管型空気分散器を備えた流動層炉の全体構成の概略を説明すると、図3に示すように、散気管本体10に空気吹出孔12を設け摩耗防止板20を取り付けた散気管22が、流動層炉24内の流動媒体中に複数本（図3では、一例として5本）埋設されており、各散気管22の空気吹出孔12から噴出される流動化ガス（空気）により、散気管22の上側で、珪砂等の流動媒体及び投入された都市ごみ、産業廃棄物等の可燃物が流動化されて流動層26が形成される。一方、散気管22の下側では、流動層26から降下する流動媒体と不燃物とで充填層28が形成され、充填層28の不燃物及び流動媒体は、スクリーン等の排出機30で流動層炉24下部から抜き出され、振動ふるい等の分級機32で不燃物は系外に排出され、流動媒体は流動層炉24内の流動層26に戻される。なお、上記の説明では、図3に示す流動層炉が流動層ごみ焼却炉である場合を述べているが、本発明の散気管型空気分散器は流動層ごみ焼却炉だけでなく、他の各種の流動層炉に適用できるものである。

【0010】このような流動層炉に用いられる散気管型空気分散器は、図1、図2に示すように、散気管本体10の側部の空気吹出孔12の上側に摩耗防止板20aが略水平方向に2枚取り付けられており、散気管本体10の上部（図3における流動層26側）が流動媒体の静止層18で被覆されるようになっている。この流動媒体の静止層18は、流動媒体固有の安息角（例えば、流動媒体が珪砂の場合は、約30度）をなす状態で散気管本体10が被覆されていればよく、摩耗防止板20aの長さ

も、流動媒体固有の安息角をなす静止層18によって散気管本体10が被覆されるような最低限の長さ、あるいは、それより若干長い長さとする。これにより、静止層18の重量は大幅に低減される。そして、空気吹出孔12から流動化ガス（空気）が噴出されて珪砂等の流動媒体及び可燃物が流動化しても、矢印Cのように循環する流動媒体14は、静止層18により散気管本体10に直接衝突することなく、流動媒体14による散気管本体10の摩耗が有効に防止される。また、空気吹出孔12の下側の流動媒体は充填層（図3における充填層28）を形成しており、しかも、流動媒体14は矢印Cのように循環するので、流動媒体14が摩耗防止板20aに衝突することなく、摩耗防止板20a自体が摩耗することもない。

【0011】また、図4に示すように、摩耗防止板20aの下側の散気管本体10側部に、空気吹出孔12を複数列（図4では、一例として2列）設ける構成とすることも可能である。ただし、摩耗性の高い流動媒体（例えば、珪砂）を使用する場合は、空気吹出孔12を1列とすることが好ましい。また、摩耗性の高い流動媒体を使用する場合等は、図5に示すように、長さを長くした摩耗防止板20bを散気管本体10側部の下方に設けて、流動媒体の静止層18で散気管本体10の管外壁が広範囲に被覆されるようにすることもできる。この場合、流動媒体が散気管本体10の下部に衝突しなくなるために、流動媒体による散気管本体10の摩耗が有効に防止される。なお、図4、図5では、散気管の左半分の構成を省略しているが、他の構成及び作用等は、図1の場合と同様である。

【0012】図6～図8は、本発明の実施の第2形態による流動層炉の散気管型空気分散器を示している。本実施の形態は、散気管側部の空気吹出孔の上側に摩耗防止板を斜め上方向に取り付けるようにしたものである。図6に示すように、散気管本体10の側部の空気吹出孔12の上側に摩耗防止板20cが斜め上方向に取り付けられており、散気管本体10の上部が流動媒体の静止層18で被覆されるようになっている。そして、空気吹出孔12から流動化ガス（空気）が噴出されて流動媒体及び可燃物が流動化しても、矢印Cのように循環する流動媒体14は、静止層18により散気管本体10に直接衝突することなく、流動媒体14による散気管本体10の摩耗が有効に防止される。また、空気吹出孔12の下側の流動媒体は充填層を形成しており、しかも、流動媒体14は矢印Cのように循環するので、流動媒体14が摩耗防止板20cに衝突することなく、摩耗防止板20c自体が摩耗することもない。

【0013】また、図7に示すように、摩耗防止板20cの下側の散気管本体10側部に、空気吹出孔12を複数列（図7では、一例として2列）設ける構成とすることも可能である。ただし、摩耗性の高い流動媒体を使用

する場合は、空気吹出孔12を1列とすることが好ましい。また、摩耗性の高い流動媒体を使用する場合等は、図8に示すように、長さを長くした摩耗防止板20dを散気管本体10側部の下方に設けて、流動媒体の静止層18で散気管本体10の管外壁が広範囲に被覆されるようにすることもできる上、散気管本体10の下部に摩耗性の高い流動媒体が衝突することを回避でき、散気管本体10の下部の摩耗が有効に防止される。なお、図6～図8では、散気管の左半分の構成を省略しているが、他の構成及び作用等は、実施の第1形態の場合と同様である。図1～図8においては、直板状の摩耗防止板を示しているが、湾曲板等、他の形状とすることも可能である。

【0014】図9は、本発明の実施の第3形態による流動層炉の散気管型空気分散器を示している。本実施の形態は、散気管を上下複数段（図9では、一例として上下2段）に千鳥配列状に配設したものである。図9に示すように、散気管本体10に空気吹出孔12を設けた散気管22が、流動層炉24内の流動媒体中に上下複数段（図9では、一例として上下2段）に千鳥配列状に配設されており、各散気管22の空気吹出孔12から噴出される流動化ガス（空気）により、散気管22の上側で、珪砂等の流動媒体及び投入された都市ごみ、産業廃棄物等の可燃物が流動化されて流動層26が形成される。一方、散気管22の下側では、流動層26から降下する流動媒体と不燃物とで充填層28が形成され、充填層28の不燃物及び流動媒体は、スクリー等の排出機30で流動層炉24下部から抜き出され、振動ふるい等の分級機32で不燃物は系外に排出され、流動媒体は流動層炉24内の流動層26に戻される。

【0015】上記のように、散気管22は上下複数段に千鳥配列状に配設されており、都市ごみや産業廃棄物等からの大塊不燃物が、散気管22の間を通り抜けて流動層炉24の下部から良好に排出されるように、散気管22の配列ピッチが広くとられた状態においても、散気管22の空気吹出孔12から噴出される流動化ガス（空気）は流動層26の断面に均一に供給されるので、流動層26の均一で良好な流動化が確保される。つまり、大塊不燃物が通り抜けられるように散気管22の配列ピッチを広げた上で、流動層26の流動化が均一になるようにその下側（あるいは上側）に千鳥配列状に散気管22を配置すればよい。特に、図9に示す流動層炉24が、ごみガス化溶融炉における部分燃焼炉（ガス化炉）である場合は、ごみ負荷が約 $1000 \sim 2000 \text{ kg/m}^2\text{h}$ であって、通常の流動層ごみ焼却炉でのごみ負荷が約 $450 \text{ kg/m}^2\text{h}$ であるのに比べて、非常に大きなごみ負荷となり、炉内の不燃物の割合も増加するので、流動層の均一で良好な流動化を維持しつつ、大塊不燃物の排出性能が損なわれない散気管間隔を確保することは重要である。なお、本実施の形態では、都市ごみ、産業廃棄物等

を燃焼させる流動層炉について説明しているが、千鳥配列状に配置された散気管型空気分散器を他の流動層炉に適用することも勿論可能である。

【0016】図10は、本発明の実施の第4形態による流動層炉の散気管型空気分散器を示している。本実施の形態は、摩耗防止板を設けた散気管型空気分散器において、散気管を上下複数段（図10では、一例として上下2段）に千鳥配列状に配設したものである。図10に示すように、散気管本体10に空気吹出孔12を設け摩耗防止板20を取り付けた散気管22が、流動層炉24内の流動媒体中に上下複数段（図10では、一例として上下2段）に千鳥配列状に配設されている。散気管の構成としては、図1、図2、図4～図8に示される構成のものが好適である。他の構成及び作用等は、実施の第1、第2、第3形態の場合と同様である。

【0017】

【発明の効果】本発明は上記のように構成されているので、つぎのような効果を奏する。

(1) 散気管の側部の空気吹出孔の上側に摩耗防止板を略水平方向又は斜め上方向に設け、散気管上部（散気管の流動層側）に流動媒体の静止層が形成されるようにしているので、流動媒体の散気管への衝突を防止して、散気管の流動媒体による摩耗を回避することができる。

(2) 摩耗防止板は略水平方向又は斜め上方向に設けられており、流動媒体の静止層が安息角をなす状態で散気管を被覆できればよいので、静止層の重量を大幅に低減させることができ、その分、散気管の肉厚を薄くすることが可能であり、コストダウンが図れる。また、摩耗防止板自体に流動媒体は衝突しないので、摩耗防止板が流動媒体により摩耗することがない。

(3) 散気管を上下複数段に千鳥配列状に配設することにより、大塊不燃物が通り抜けられるように散気管配列ピッチを広くした上で、流動媒体及び可燃物の流動化が均一になるので、均一で良好な流動化と大塊不燃物の排出性が同時に実現できる。

【図面の簡単な説明】

【図1】本発明の実施の第1形態による流動層炉の散気管型空気分散器の一例を示す拡大断面図である。

【図2】図1に示す散気管の側面図である。

【図3】本発明の実施の第1形態における散気管型空気分散器を用いた流動層炉の全体構成を示す概略構成図である。

【図4】本発明の実施の第1形態による流動層炉の散気管型空気分散器の他の例を示す拡大断面図である。

【図5】本発明の実施の第1形態による流動層炉の散気管型空気分散器のさらに他の例を示す拡大断面図である。

【図6】本発明の実施の第2形態による流動層炉の散気管型空気分散器の一例を示す拡大断面図である。

【図7】本発明の実施の第2形態による流動層炉の散気

管型空気分散器の他の例を示す拡大断面図である。

【図8】本発明の実施の第2形態による流動層炉の散気管型空気分散器のさらに他の例を示す拡大断面図である。

【図9】本発明の実施の第3形態による流動層炉の散気管型空気分散器まわりを示す概略構成図である。

【図10】本発明の実施の第4形態による流動層炉の散気管型空気分散器まわりを示す概略構成図である。

【図11】従来の流動層炉の散気管型空気分散器の一例を示す拡大断面図である。

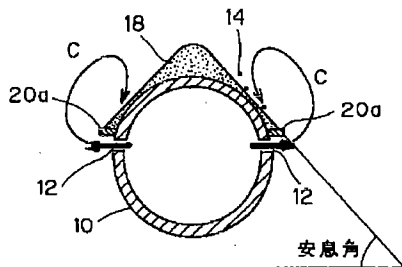
【図12】従来の流動層炉の散気管型空気分散器の他の例を示す拡大断面図である。

【図13】図12に示す散気管の側面図である。

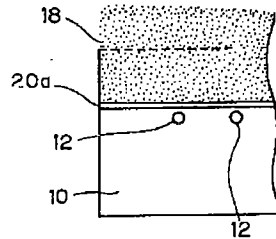
【符号の説明】

- 10 散気管本体
- 12 空気吹出孔
- 14 流動媒体
- 16 滞留部材
- 18 流動媒体の静止層
- 20、20a、20b、20c、20d 摩耗防止板
- 22 散気管
- 24 流動層炉
- 26 流動層
- 28 充填層
- 30 排出機
- 32 分級機

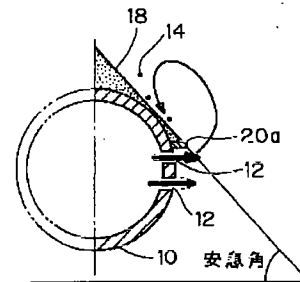
【図1】



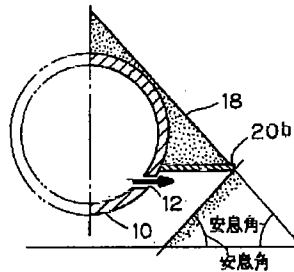
【図2】



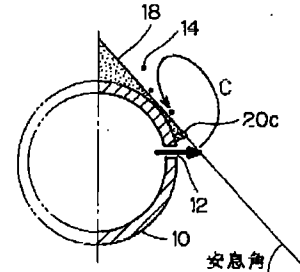
【図4】



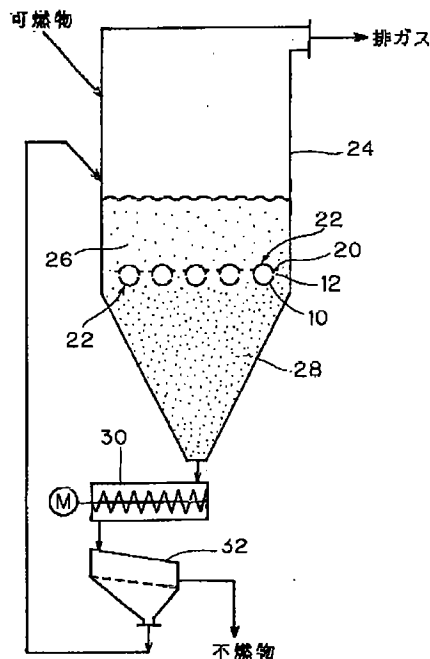
【図5】



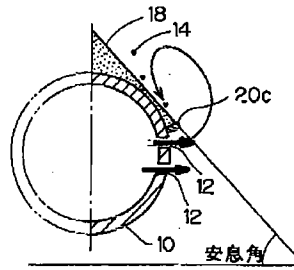
【図6】



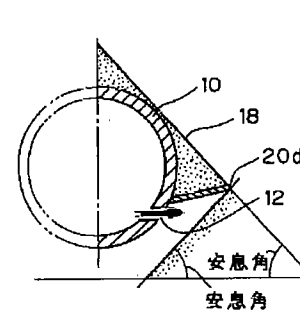
【図3】



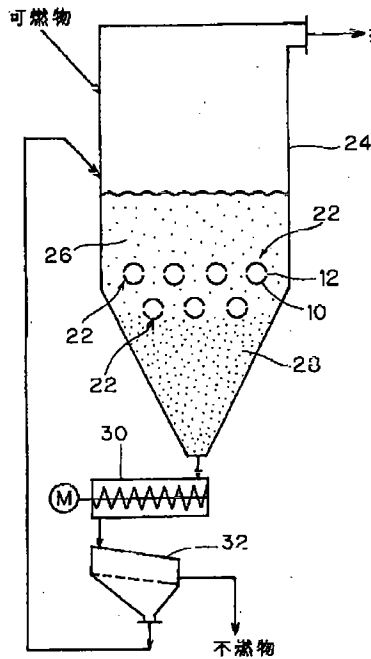
【図7】



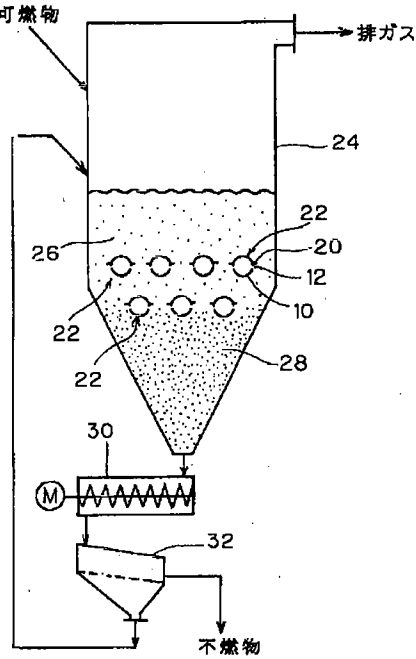
【図8】



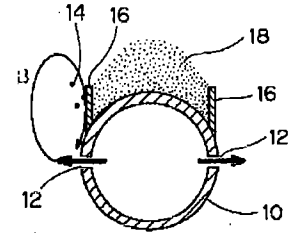
【図9】



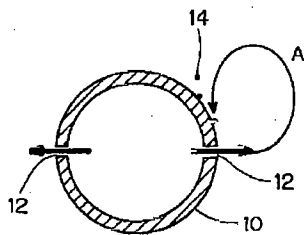
【図10】



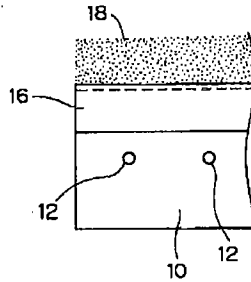
【図12】



【図11】



【図13】



【手続補正書】

【提出日】平成11年2月15日

【手続補正1】

【補正対象書類名】明細書

【補正対象項目名】請求項2

【補正方法】変更

【補正内容】

【請求項2】 複数本の散気管からなる空気分散器の上側に流動媒体と可燃物とを流動化させるための流動層を形成するとともに、空気分散器の下側に前記流動層から降下する流動媒体と不燃物との充填層を形成するようにした流動層炉において、大塊不燃物が通り抜けられるように散気管配列ピッチを広くした上で、流動媒体及び

可燃物の流動化が均一になるように、散気管が上下複数段に千鳥配列状に配設されたことを特徴とする流動層炉の散気管型空気分散器。

【手続補正2】

【補正対象書類名】明細書

【補正対象項目名】0008

【補正方法】変更

【補正内容】

【0008】また、本発明の流動層炉の散気管型空気分散器は、複数本の散気管からなる空気分散器の上側に流動媒体と可燃物とを流動化させるための流動層を形成するとともに、空気分散器の下側に前記流動層から降下

する流動媒体と不燃物との充填層を形成するようにした流動層炉において、大塊不燃物が通り抜けられるように散気管配列ピッチを広くした上で、流動媒体及び可燃物の流動化が均一になるように、散気管が上下複数段に千鳥配列状に配設されたことを特徴としている（図9参照）。散気管を上下複数段（例えば、上下2段）に千鳥

配列状に配置することにより、大塊不燃物が通り抜けられる散気管間隔を確保しつつ、流動層の均一で良好な流動化が実現できる。その詳細については後述する。上記の摩耗防止板を設けた散気管型空気分散器において、散気管を上下複数段に千鳥配列状に配設する構成とすることもできる（図10参照）。

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CLAIMS

[Claim(s)]

[Claim 1] As if the fluid bed for making the air distribution machine upper part which consists of two or more aeration pipes mobilize a bed material and combustibles is formed, both, In a fluidized bed furnace which formed in the air distribution machine bottom a packed bed of a bed material and incombustibles which descend from said fluid bed, An aeration pipe type air distribution machine of a fluidized bed furnace characterized by making it make a stillness layer of a bed material which forms a wear preventive plate for preventing wear of an aeration pipe to the air blowout hole up side of a flank of an aeration pipe in an abbreviated horizontal direction or slanting above one, and covers the aeration pipe upper part with a bed material form.

[Claim 2] As if the fluid bed for making the air distribution machine upper part which consists of two or more aeration pipes mobilize a bed material and combustibles is formed, both, An aeration pipe type air distribution machine of a fluidized bed furnace, wherein an aeration pipe is allocated in two or more steps of upper and lower sides in the shape of staggered arrangement in a fluidized bed furnace which formed in the air distribution machine bottom a packed bed of a bed material and incombustibles which descend from said fluid bed.

[Claim 3] An aeration pipe type air distribution machine of the fluidized bed furnace according to claim 1 with which an aeration pipe was allocated in two or more steps of upper and lower sides in the shape of staggered arrangement.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the aeration pipe type air distribution machine in fluidized bed furnaces, such as a fluid bed incinerator.

It is related with the aeration pipe type air distribution machine of the fluidized bed furnace which can aim at prevention from wear of the main part of an aeration pipe, and can reconcile uniform and good mobilization and the eccentric nature of large mass incombustibles in detail.

[0002]

[Description of the Prior Art]In fluidized bed furnaces, such as a fluid bed incinerator, the air distribution machine which consists of two or more aeration pipes in a furnace is allocated in one step at level surface state, The thing of structure which makes the fluid bed by which combustibles and bed materials, such as a municipal solid waste and industrial waste, are mobilized form in these aeration pipe upper part and in which made it make the packed bed of the bed material and incombustibles which descend from the fluid bed to the aeration pipe down side form is known. In the aeration pipe type air distribution machine used for the above fluidized bed furnaces, as shown in drawing 11, air blows off from the air blowout hole 12 established in the flank of the main part 10 of an aeration pipe, and a bed material and combustibles, such as silica sand, mobilize, but. The bed material 14 through which it circulates like the arrow A collided with the main part 10 of an aeration pipe, and was wearing the main part 10 of an aeration pipe.

[0003]As what prevents the collision to the aeration pipe of such a bed material, and aims at the measure against wear of an aeration pipe, the structure which provided the stagnation member for making the stillness layer of a bed material form in accordance with the pipe outer wall of an aeration pipe in the substantially vertical direction is indicated by JP,59-48432,U. The aeration pipe structure indicated to JP,59-48432,U, As shown in drawing 12 and drawing 13, by the stagnation member 16 of two sheets provided in the air blowout hole 12 upper part of the main part 10 of an aeration pipe in the substantially vertical direction. As the stillness layer 18 of a bed material is made to form in the pipe outer wall of the main part 10 (aeration pipe upper part) of an aeration pipe by the side of the fluid bed and the mobilized bed material does not carry out a direct collision to the main part 10 of an aeration pipe, prevention from wear of the main part 10 of an aeration pipe is aimed at.

[0004]

[Problem(s) to be Solved by the Invention]However, in aeration pipe structure which was indicated to JP,59-48432,U. Since the stagnation member 16 is arranged in the substantially vertical direction as shown in drawing 12 and drawing 13, The amount of bed materials of the stillness layer 18 increases, there is a problem that the weight of the stillness layer 18 formed in the pipe outer wall upper part of the main part 10 of an aeration pipe becomes large more than needed, and stillness layer weight needs to thicken thickness of a large part and an aeration pipe, and also becomes a cost hike. Since it circulates through the bed material 14 like the arrow B as shown in drawing 12, the bed material 14 collides with

the stagnation member 16, and makes stagnation member 16 the very thing worn out.

[0005]In fluidized bed furnaces, such as a fluid bed incinerator, with the composition which arranges an aeration pipe to one step superficially. If it is necessary to enlarge an aeration pipe array pitch and an aeration pipe interval becomes large to such an extent that large mass incombustibles pass, it is difficult to realize simultaneously uniform and good mobilization and eccentric nature of large mass incombustibles from mobilization of a bed material and combustibles becoming uneven.

[0006]This invention was made in view of above-mentioned many points, and the purpose of this invention, In the aeration pipe type air distribution machine used for fluidized bed furnaces, such as a fluid bed incinerator, So that the pipe outer wall of the aeration pipe upper part (fluid bed side of an aeration pipe) may be covered with the minimum amount of bed materials, As a bed material does not carry out a direct collision to an aeration pipe by making the stillness layer of a bed material form in the aeration pipe upper part, while it prevents wear of an aeration pipe, it is in providing the aeration pipe type air distribution machine of the fluidized bed furnace which reduces stillness layer weight and could be made to make thickness of the aeration pipe thin. After the purpose of this invention makes an aeration pipe array pitch large in the aeration pipe type air distribution machine used for fluidized bed furnaces, such as a fluid bed incinerator, so that large mass incombustibles may pass, Providing the aeration pipe type air distribution machine of the fluidized bed furnace it was made to become uniform has mobilization of a bed material and combustibles.

[0007]

[Means for Solving the Problem]In order to attain the above-mentioned purpose, an aeration pipe type air distribution machine of a fluidized bed furnace of this invention, As if the fluid bed for making the air distribution machine upper part which consists of two or more aeration pipes mobilize a bed material and combustibles is formed, both, In a fluidized bed furnace which formed in the air distribution machine bottom a packed bed of a bed material and incombustibles which descend from said fluid bed, A wear preventive plate for preventing wear of an aeration pipe to the air blowout hole up side of a flank of an aeration pipe is formed in an abbreviated horizontal direction or slanting above one, and it is characterized by making it make a stillness layer of a bed material which covers the aeration pipe upper part (fluid bed side of an aeration pipe) with a bed material form (refer to drawing 1 - drawing 8). In this case, as for a wear preventive plate, it is preferred to consider it as minimum length with which an aeration pipe is covered by stillness layer which makes an angle of repose peculiar to a bed material, or length a little longer than it. By covering an aeration pipe by a bed material stillness layer which makes an angle of repose, stillness layer weight can be reduced substantially.

[0008]An aeration pipe type air distribution machine of a fluidized bed furnace of this invention, As if the fluid bed for making the air distribution machine upper part which consists of two or more aeration pipes mobilize a bed material and combustibles is formed, both, In a fluidized bed furnace which formed in the air distribution machine bottom a packed bed of a bed material and incombustibles which descend from said fluid bed, it is characterized by allocating an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement (refer to drawing 9). Mobilization uniform [the fluid bed] and good is realizable, securing an aeration pipe interval through which large mass incombustibles pass by arranging an aeration pipe in the shape of staggered arrangement to two or more steps (for example, two steps of upper and lower sides) of upper and lower sides. The details are mentioned later. In an aeration pipe type air distribution machine which formed the above-mentioned wear preventive plate, it can also have composition which allocates an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement (refer to drawing 10).

[0009]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described in detail.

Drawing 1 - drawing 5 show the aeration pipe type air distribution machine of the fluidized bed furnace by the 1st gestalt of operation of this invention. This embodiment attaches a wear preventive plate to an abbreviated horizontal direction at the air blowout hole upper part of an aeration pipe flank. First, if the outline of the entire configuration of the fluidized bed furnace provided with the aeration pipe type air distribution machine is explained, as shown in drawing 3, The aeration pipe 22 which established the air

blowout hole 12 in the main part 10 of an aeration pipe, and attached the wear preventive plate 20 is [two or more / (in drawing 3.)] in the bed material in the fluidized bed furnace 24. 5 burial is carried out as an example, by the fluidizing gas (air) which blows off from the air blowout hole 12 of each aeration pipe 22, with the aeration pipe 22 up side, combustibles, such as bed materials, such as silica sand, and a supplied municipal solid waste, and industrial waste, are mobilized, and the fluid bed 26 is formed. With the bed material and incombustibles which descend from the fluid bed 26, on the other hand with the aeration pipe 22 down side, it is formed by the packed bed 28, and the incombustibles and the bed material of the packed bed 28, It is extracted from the fluidized bed furnace 24 lower part with the discharge machines 30, such as a screw, incombustibles are discharged out of a system with the classifiers 32, such as the vibrating screen, and a bed material is returned to the fluid bed 26 in the fluidized bed furnace 24. Although the above-mentioned explanation has described the case where the fluidized bed furnace shown in drawing 3 is a fluid bed incinerator, the aeration pipe type air distribution machine of this invention is applicable not only to a fluid bed incinerator but other fluidized bed furnaces of various kinds of.

[0010]The aeration pipe type air distribution machine used for such a fluidized bed furnace, As shown in drawing 1 and drawing 2, the two wear preventive plates 20a are attached to the abbreviated horizontal direction at the air blowout hole 12 upper part of the flank of the main part 10 of an aeration pipe, and the upper part (the fluid bed 26 side in drawing 3) of the main part 10 of an aeration pipe is covered with the stillness layer 18 of a bed material. An angle of repose with the stillness layer 18 of this bed material peculiar to a bed material (for example, when a bed material is silica sand) The main part 10 of an aeration pipe should just be covered with the state of making about 30 degrees, and also let the length of the wear preventive plate 20a be minimum length with which the main part 10 of an aeration pipe is covered by the stillness layer 18 which makes an angle of repose peculiar to a bed material, or length a little longer than it. Thereby, the weight of the stillness layer 18 is reduced substantially. And the bed material 14 through which it circulates like the arrow C even if fluidizing gas (air) blows off from the air blowout hole 12 and a bed material and combustibles, such as silica sand, mobilize, A direct collision is not carried out to the main part 10 of an aeration pipe by the stillness layer 18, and wear of the main part 10 of an aeration pipe by the bed material 14 is prevented effectively. Since the bed material of the air blowout hole 12 bottom forms the packed bed (packed bed 28 in drawing 3) and moreover circulates through the bed material 14 like the arrow C, the bed material 14 does not collide with the wear preventive plate 20a, and the wear preventive plate 20a itself is not worn out.

[0011]As shown in drawing 4, it is also possible to have composition as for which plural lines (two rows as [Drawing 4] an example) establish the air blowout hole 12 in main part of aeration pipe 10 flank of the wear preventive plate 20a bottom. However, when using the high bed material (for example, silica sand) of abrasiveness, it is preferred to make the air blowout hole 12 into one row. When using the high bed material of abrasiveness, as shown in drawing 5, main part of aeration pipe 10 flank forms caudad the wear preventive plate 20b which lengthened length, and the pipe outer wall of the main part 10 of an aeration pipe can be broadly covered with the stillness layer 18 of a bed material. In this case, in order that a bed material may not collide with the lower part of the main part 10 of an aeration pipe, wear of the main part 10 of an aeration pipe by a bed material is prevented effectively. At drawing 4 and drawing 5, although the composition in the left half of an aeration pipe is omitted, other composition, operations, etc. are the same as that of the case of drawing 1.

[0012]Drawing 6 - drawing 8 show the aeration pipe type air distribution machine of the fluidized bed furnace by the 2nd gestalt of operation of this invention. This embodiment attaches a wear preventive plate to the air blowout hole upper part of an aeration pipe flank slanting above one. As shown in drawing 6, the wear preventive plate 20c is attached to the air blowout hole 12 upper part of the flank of the main part 10 of an aeration pipe slanting above one, and the upper part of the main part 10 of an aeration pipe is covered with the stillness layer 18 of a bed material. And even if fluidizing gas (air) blows off from the air blowout hole 12 and a bed material and combustibles mobilize, the direct collision of the bed material 14 through which it circulates like the arrow C is not carried out to the main part 10 of an aeration pipe by the stillness layer 18, and wear of the main part 10 of an aeration pipe by

the bed material 14 is prevented effectively. Since the bed material of the air blowout hole 12 bottom forms the packed bed and moreover circulates through the bed material 14 like the arrow C, the bed material 14 does not collide with the wear preventive plate 20c, and the wear preventive plate 20c itself is not worn out.

[0013]As shown in drawing 7, it is also possible to have composition as for which plural lines (two rows as [Drawing 7] an example) establish the air blowout hole 12 in main part of aeration pipe 10 flank of the wear preventive plate 20c bottom. However, when using the high bed material of abrasiveness, it is preferred to make the air blowout hole 12 into one row. When using the high bed material of abrasiveness, As shown in drawing 8, main part of aeration pipe 10 flank forms caudad the wear preventive plate 20d which lengthened length, The pipe outer wall of the main part 10 of an aeration pipe can be broadly covered with the stillness layer 18 of a bed material, and also it can avoid that the high bed material of abrasiveness collides with the lower part of the main part 10 of an aeration pipe, and wear of the lower part of the main part 10 of an aeration pipe is prevented effectively. At drawing 6 - drawing 8, although the composition in the left half of an aeration pipe is omitted, other composition, operations, etc. are the same as that of the case of the 1st gestalt of operation. In drawing 1 - drawing 8, although the direct tabular wear preventive plate is shown, a curve board etc. are possible also for considering it as other shape.

[0014]Drawing 9 shows the aeration pipe type air distribution machine of the fluidized bed furnace by the 3rd gestalt of operation of this invention. This embodiment allocates an aeration pipe in two or more steps (two steps of upper and lower sides as [Drawing 9] an example) of upper and lower sides in the shape of staggered arrangement. As shown in drawing 9, the aeration pipes 22 which established the air blowout hole 12 in the main part 10 of an aeration pipe are two or more steps (in drawing 9.) of upper and lower sides in the bed material in the fluidized bed furnace 24. It is allocated in two steps of upper and lower sides in the shape of staggered arrangement as an example, and by the fluidizing gas (air) which blows off from the air blowout hole 12 of each aeration pipe 22, with the aeration pipe 22 up side, combustibles, such as bed materials, such as silica sand, and a supplied municipal solid waste, and industrial waste, are mobilized, and the fluid bed 26 is formed. With the bed material and incombustibles which descend from the fluid bed 26, on the other hand with the aeration pipe 22 down side, it is formed by the packed bed 28, and the incombustibles and the bed material of the packed bed 28, It is extracted from the fluidized bed furnace 24 lower part with the discharge machines 30, such as a screw, incombustibles are discharged out of a system with the classifiers 32, such as the vibrating screen, and a bed material is returned to the fluid bed 26 in the fluidized bed furnace 24.

[0015]As mentioned above, so that the aeration pipe 22 is allocated in two or more steps of upper and lower sides in the shape of staggered arrangement, and the large mass incombustibles from a municipal solid waste, industrial waste, etc. may pass between the aeration pipes 22 and may be discharged good from the lower part of the fluidized bed furnace 24, Also in the state where the large array pitch of the aeration pipe 22 was taken, since the fluidizing gas (air) which blows off from the air blowout hole 12 of the aeration pipe 22 is uniformly supplied to the section of the fluid bed 26, uniform and good mobilization of the fluid bed 26 is secured. That is, what is necessary is just to arrange the aeration pipe 22 in the shape of staggered arrangement to the down side (or on) so that mobilization of the fluid bed 26 may become uniform after extending the array pitch of the aeration pipe 22 so that large mass incombustibles may pass. Especially when the fluidized bed furnace 24 shown in drawing 9 is a partial combustion furnace (gasifier) in a garbage gasified melting furnace, It compares, although garbage load is about 1000-2000kg/m²h and the garbage load in the usual fluid bed incinerator is about 450kg/m²h, It is important to secure the aeration pipe interval by which the discharging efficiency of large mass incombustibles is not spoiled, maintaining mobilization uniform [the fluid bed] and good, since it becomes very big garbage load and the rate of the incombustibles in a furnace also increases. Although this embodiment explains the fluidized bed furnace which burns a municipal solid waste, industrial waste, etc., of course, it is also possible to apply the aeration pipe type air distribution machine arranged in the shape of staggered arrangement to other fluidized bed furnaces.

[0016] Drawing 10 shows the aeration pipe type air distribution machine of the fluidized bed furnace by the 4th gestalt of operation of this invention. In the aeration pipe type air distribution machine which formed the wear preventive plate, this embodiment allocates an aeration pipe in two or more steps (two steps of upper and lower sides as [Drawing 10] an example) of upper and lower sides in the shape of staggered arrangement. As shown in drawing 10, the aeration pipe 22 which established the air blowout hole 12 in the main part 10 of an aeration pipe, and attached the wear preventive plate 20 is allocated by two or more steps (two steps of upper and lower sides as [Drawing 10] an example) of upper and lower sides in the shape of staggered arrangement into the bed material in the fluidized bed furnace 24. As composition of an aeration pipe, the thing of composition of being shown in drawing 1, drawing 2, drawing 4 - drawing 8 is preferred. Other composition, operations, etc. are the same as that of the case of the 1st, 2nd, and 3rd gestalt of operation.

[0017]

[Effect of the Invention] Since this invention is constituted as mentioned above, the following effects are done so.

- (1) Since a wear preventive plate is formed in the air blowout hole upper part of the flank of an aeration pipe an abbreviated horizontal direction or slanting above one and the stillness layer of a bed material is made to be formed in the aeration pipe upper part (fluid bed side of an aeration pipe), The collision to the aeration pipe of a bed material can be prevented, and wear by the bed material of an aeration pipe can be avoided.
- (2) The wear preventive plate is formed in an abbreviated horizontal direction or slanting above one, since the stillness layer of a bed material just covers an aeration pipe with the state of making an angle of repose, the weight of a stillness layer can be reduced substantially, it is possible in making thickness of the part and an aeration pipe thin, and a cost cut can be aimed at. Since a bed material does not collide with the wear preventive plate itself, a wear preventive plate is not worn out with a bed material.
- (3) Since mobilization of a bed material and combustibles becomes uniform after making an aeration pipe array pitch large so that large mass incombustibles may pass by allocating an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement, uniform and good mobilization and eccentric nature of large mass incombustibles can be realized simultaneously.

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the aeration pipe type air distribution machine in fluidized bed furnaces, such as a fluid bed incinerator.

It is related with the aeration pipe type air distribution machine of the fluidized bed furnace which can aim at prevention from wear of the main part of an aeration pipe, and can reconcile uniform and good mobilization and the eccentric nature of large mass incombustibles in detail.

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PRIOR ART

[Description of the Prior Art]In fluidized bed furnaces, such as a fluid bed incinerator, the air distribution machine which consists of two or more aeration pipes in a furnace is allocated in one step at level surface state, The thing of structure which makes the fluid bed by which combustibles and bed materials, such as a municipal solid waste and industrial waste, are mobilized form in these aeration pipe upper part and in which made it make the packed bed of the bed material and incombustibles which descend from the fluid bed to the aeration pipe down side form is known. In the aeration pipe type air distribution machine used for the above fluidized bed furnaces, as shown in drawing 11, air blows off from the air blowout hole 12 established in the flank of the main part 10 of an aeration pipe, and a bed material and combustibles, such as silica sand, mobilize, but. The bed material 14 through which it circulates like the arrow A collided with the main part 10 of an aeration pipe, and was wearing the main part 10 of an aeration pipe.

[0003]As what prevents the collision to the aeration pipe of such a bed material, and aims at the measure against wear of an aeration pipe, the structure which provided the stagnation member for making the stillness layer of a bed material form in accordance with the pipe outer wall of an aeration pipe in the substantially vertical direction is indicated by JP,59-48432,U. The aeration pipe structure indicated to JP,59-48432,U, As shown in drawing 12 and drawing 13, by the stagnation member 16 of two sheets provided in the air blowout hole 12 upper part of the main part 10 of an aeration pipe in the substantially vertical direction. As the stillness layer 18 of a bed material is made to form in the pipe outer wall of the main part 10 (aeration pipe upper part) of an aeration pipe by the side of the fluid bed and the mobilized bed material does not carry out a direct collision to the main part 10 of an aeration pipe, prevention from wear of the main part 10 of an aeration pipe is aimed at.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since this invention is constituted as mentioned above, the following effects are done so.

- (1) Since a wear preventive plate is formed in the air blowout hole upper part of the flank of an aeration pipe an abbreviated horizontal direction or slanting above one and the stillness layer of a bed material is made to be formed in the aeration pipe upper part (fluid bed side of an aeration pipe), The collision to the aeration pipe of a bed material can be prevented, and wear by the bed material of an aeration pipe can be avoided.
- (2) The wear preventive plate is formed in an abbreviated horizontal direction or slanting above one, since the stillness layer of a bed material just covers an aeration pipe with the state of making an angle of repose, the weight of a stillness layer can be reduced substantially, it is possible in making thickness of the part and an aeration pipe thin, and a cost cut can be aimed at. Since a bed material does not collide with the wear preventive plate itself, a wear preventive plate is not worn out with a bed material.
- (3) Since mobilization of a bed material and combustibles becomes uniform after making an aeration pipe array pitch large so that large mass incombustibles may pass by allocating an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement, uniform and good mobilization and eccentric nature of large mass incombustibles can be realized simultaneously.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, in aeration pipe structure which was indicated to JP,59-48432,U. Since the stagnation member 16 is arranged in the substantially vertical direction as shown in drawing 12 and drawing 13, The amount of bed materials of the stillness layer 18 increases, there is a problem that the weight of the stillness layer 18 formed in the pipe outer wall upper part of the main part 10 of an aeration pipe becomes large more than needed, and stillness layer weight needs to thicken thickness of a large part and an aeration pipe, and also becomes a cost hike. Since it circulates through the bed material 14 like the arrow B as shown in drawing 12, the bed material 14 collides with the stagnation member 16, and makes stagnation member 16 the very thing worn out.

[0005]In fluidized bed furnaces, such as a fluid bed incinerator, with the composition which arranges an aeration pipe to one step superficially. If it is necessary to enlarge an aeration pipe array pitch and an aeration pipe interval becomes large to such an extent that large mass incombustibles pass, it is difficult to realize simultaneously uniform and good mobilization and eccentric nature of large mass incombustibles from mobilization of a bed material and combustibles becoming uneven.

[0006]This invention was made in view of above-mentioned many points, and the purpose of this invention, In the aeration pipe type air distribution machine used for fluidized bed furnaces, such as a fluid bed incinerator, So that the pipe outer wall of the aeration pipe upper part (fluid bed side of an aeration pipe) may be covered with the minimum amount of bed materials, As a bed material does not carry out a direct collision to an aeration pipe by making the stillness layer of a bed material form in the aeration pipe upper part, while it prevents wear of an aeration pipe, it is in providing the aeration pipe type air distribution machine of the fluidized bed furnace which reduces stillness layer weight and could be made to make thickness of the aeration pipe thin. After the purpose of this invention makes an aeration pipe array pitch large in the aeration pipe type air distribution machine used for fluidized bed furnaces, such as a fluid bed incinerator, so that large mass incombustibles may pass, Providing the aeration pipe type air distribution machine of the fluidized bed furnace it was made to become uniform has mobilization of a bed material and combustibles.

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MEANS

[Means for Solving the Problem]In order to attain the above-mentioned purpose, an aeration pipe type air distribution machine of a fluidized bed furnace of this invention, As if the fluid bed for making the air distribution machine upper part which consists of two or more aeration pipes mobilize a bed material and combustibles is formed, both, In a fluidized bed furnace which formed in the air distribution machine bottom a packed bed of a bed material and incombustibles which descend from said fluid bed, A wear preventive plate for preventing wear of an aeration pipe to the air blowout hole up side of a flank of an aeration pipe is formed in an abbreviated horizontal direction or slanting above one, and it is characterized by making it make a stillness layer of a bed material which covers the aeration pipe upper part (fluid bed side of an aeration pipe) with a bed material form (refer to drawing 1 - drawing 8). In this case, as for a wear preventive plate, it is preferred to consider it as minimum length with which an aeration pipe is covered by stillness layer which makes an angle of repose peculiar to a bed material, or length a little longer than it. By covering an aeration pipe by a bed material stillness layer which makes an angle of repose, stillness layer weight can be reduced substantially.

[0008]An aeration pipe type air distribution machine of a fluidized bed furnace of this invention, As if the fluid bed for making the air distribution machine upper part which consists of two or more aeration pipes mobilize a bed material and combustibles is formed, both, In a fluidized bed furnace which formed in the air distribution machine bottom a packed bed of a bed material and incombustibles which descend from said fluid bed, it is characterized by allocating an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement (refer to drawing 9). Mobilization uniform [the fluid bed] and good is realizable, securing an aeration pipe interval through which large mass incombustibles pass by arranging an aeration pipe in the shape of staggered arrangement to two or more steps (for example, two steps of upper and lower sides) of upper and lower sides. The details are mentioned later. In an aeration pipe type air distribution machine which formed the above-mentioned wear preventive plate, it can also have composition which allocates an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement (refer to drawing 10).

[0009]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described in detail.

Drawing 1 - drawing 5 show the aeration pipe type air distribution machine of the fluidized bed furnace by the 1st gestalt of operation of this invention. This embodiment attaches a wear preventive plate to an abbreviated horizontal direction at the air blowout hole upper part of an aeration pipe flank. First, if the outline of the entire configuration of the fluidized bed furnace provided with the aeration pipe type air distribution machine is explained, as shown in drawing 3, The aeration pipe 22 which established the air blowout hole 12 in the main part 10 of an aeration pipe, and attached the wear preventive plate 20 is [two or more / (in drawing 3.)] in the bed material in the fluidized bed furnace 24. 5 burial is carried out as an example, by the fluidizing gas (air) which blows off from the air blowout hole 12 of each aeration pipe 22, with the aeration pipe 22 up side, combustibles, such as bed materials, such as silica sand, and a supplied municipal solid waste, and industrial waste, are mobilized, and the fluid bed 26 is formed. With the bed material and incombustibles which descend from the fluid bed 26, on the other

hand with the aeration pipe 22 down side, it is formed by the packed bed 28, and the incombustibles and the bed material of the packed bed 28, It is extracted from the fluidized bed furnace 24 lower part with the discharge machines 30, such as a screw, incombustibles are discharged out of a system with the classifiers 32, such as the vibrating screen, and a bed material is returned to the fluid bed 26 in the fluidized bed furnace 24. Although the above-mentioned explanation has described the case where the fluidized bed furnace shown in drawing 3 is a fluid bed incinerator, the aeration pipe type air distribution machine of this invention is applicable not only to a fluid bed incinerator but other fluidized bed furnaces of various kinds of.

[0010]The aeration pipe type air distribution machine used for such a fluidized bed furnace, As shown in drawing 1 and drawing 2, the two wear preventive plates 20a are attached to the abbreviated horizontal direction at the air blowout hole 12 upper part of the flank of the main part 10 of an aeration pipe, and the upper part (the fluid bed 26 side in drawing 3) of the main part 10 of an aeration pipe is covered with the stillness layer 18 of a bed material. An angle of repose with the stillness layer 18 of this bed material peculiar to a bed material (for example, when a bed material is silica sand) The main part 10 of an aeration pipe should just be covered with the state of making about 30 degrees, and also let the length of the wear preventive plate 20a be minimum length with which the main part 10 of an aeration pipe is covered by the stillness layer 18 which makes an angle of repose peculiar to a bed material, or length a little longer than it. Thereby, the weight of the stillness layer 18 is reduced substantially. And the bed material 14 through which it circulates like the arrow C even if fluidizing gas (air) blows off from the air blowout hole 12 and a bed material and combustibles, such as silica sand, mobilize, A direct collision is not carried out to the main part 10 of an aeration pipe by the stillness layer 18, and wear of the main part 10 of an aeration pipe by the bed material 14 is prevented effectively. Since the bed material of the air blowout hole 12 bottom forms the packed bed (packed bed 28 in drawing 3) and moreover circulates through the bed material 14 like the arrow C, the bed material 14 does not collide with the wear preventive plate 20a, and the wear preventive plate 20a itself is not worn out.

[0011]As shown in drawing 4, it is also possible to have composition as for which plural lines (two rows as [Drawing 4] an example) establish the air blowout hole 12 in main part of aeration pipe 10 flank of the wear preventive plate 20a bottom. However, when using the high bed material (for example, silica sand) of abrasiveness, it is preferred to make the air blowout hole 12 into one row. When using the high bed material of abrasiveness, as shown in drawing 5, main part of aeration pipe 10 flank forms caudad the wear preventive plate 20b which lengthened length, and the pipe outer wall of the main part 10 of an aeration pipe can be broadly covered with the stillness layer 18 of a bed material. In this case, in order that a bed material may not collide with the lower part of the main part 10 of an aeration pipe, wear of the main part 10 of an aeration pipe by a bed material is prevented effectively. At drawing 4 and drawing 5, although the composition in the left half of an aeration pipe is omitted, other composition, operations, etc. are the same as that of the case of drawing 1.

[0012]Drawing 6 - drawing 8 show the aeration pipe type air distribution machine of the fluidized bed furnace by the 2nd gestalt of operation of this invention. This embodiment attaches a wear preventive plate to the air blowout hole upper part of an aeration pipe flank slanting above one. As shown in drawing 6, the wear preventive plate 20c is attached to the air blowout hole 12 upper part of the flank of the main part 10 of an aeration pipe slanting above one, and the upper part of the main part 10 of an aeration pipe is covered with the stillness layer 18 of a bed material. And even if fluidizing gas (air) blows off from the air blowout hole 12 and a bed material and combustibles mobilize, the direct collision of the bed material 14 through which it circulates like the arrow C is not carried out to the main part 10 of an aeration pipe by the stillness layer 18, and wear of the main part 10 of an aeration pipe by the bed material 14 is prevented effectively. Since the bed material of the air blowout hole 12 bottom forms the packed bed and moreover circulates through the bed material 14 like the arrow C, the bed material 14 does not collide with the wear preventive plate 20c, and the wear preventive plate 20c itself is not worn out.

[0013]As shown in drawing 7, it is also possible to have composition as for which plural lines (two rows as [Drawing 7] an example) establish the air blowout hole 12 in main part of aeration pipe 10 flank of

the wear preventive plate 20c bottom. However, when using the high bed material of abrasiveness, it is preferred to make the air blowout hole 12 into one row. When using the high bed material of abrasiveness, As shown in drawing 8, main part of aeration pipe 10 flank forms caudad the wear preventive plate 20d which lengthened length, The pipe outer wall of the main part 10 of an aeration pipe can be broadly covered with the stillness layer 18 of a bed material, and also it can avoid that the high bed material of abrasiveness collides with the lower part of the main part 10 of an aeration pipe, and wear of the lower part of the main part 10 of an aeration pipe is prevented effectively. At drawing 6 - drawing 8, although the composition in the left half of an aeration pipe is omitted, other composition, operations, etc. are the same as that of the case of the 1st gestalt of operation. In drawing 1 - drawing 8, although the direct tabular wear preventive plate is shown, a curve board etc. are possible also for considering it as other shape.

[0014]Drawing 9 shows the aeration pipe type air distribution machine of the fluidized bed furnace by the 3rd gestalt of operation of this invention. This embodiment allocates an aeration pipe in two or more steps (two steps of upper and lower sides as [Drawing 9] an example) of upper and lower sides in the shape of staggered arrangement. As shown in drawing 9, the aeration pipes 22 which established the air blowout hole 12 in the main part 10 of an aeration pipe are two or more steps (in drawing 9.) of upper and lower sides in the bed material in the fluidized bed furnace 24. It is allocated in two steps of upper and lower sides in the shape of staggered arrangement as an example, and by the fluidizing gas (air) which blows off from the air blowout hole 12 of each aeration pipe 22, with the aeration pipe 22 up side, combustibles, such as bed materials, such as silica sand, and a supplied municipal solid waste, and industrial waste, are mobilized, and the fluid bed 26 is formed. With the bed material and incombustibles which descend from the fluid bed 26, on the other hand with the aeration pipe 22 down side, it is formed by the packed bed 28, and the incombustibles and the bed material of the packed bed 28, It is extracted from the fluidized bed furnace 24 lower part with the discharge machines 30, such as a screw, incombustibles are discharged out of a system with the classifiers 32, such as the vibrating screen, and a bed material is returned to the fluid bed 26 in the fluidized bed furnace 24.

[0015]As mentioned above, so that the aeration pipe 22 is allocated in two or more steps of upper and lower sides in the shape of staggered arrangement, and the large mass incombustibles from a municipal solid waste, industrial waste, etc. may pass between the aeration pipes 22 and may be discharged good from the lower part of the fluidized bed furnace 24, Also in the state where the large array pitch of the aeration pipe 22 was taken, since the fluidizing gas (air) which blows off from the air blowout hole 12 of the aeration pipe 22 is uniformly supplied to the section of the fluid bed 26, uniform and good mobilization of the fluid bed 26 is secured. That is, what is necessary is just to arrange the aeration pipe 22 in the shape of staggered arrangement to the down side (or on) so that mobilization of the fluid bed 26 may become uniform after extending the array pitch of the aeration pipe 22 so that large mass incombustibles may pass. Especially when the fluidized bed furnace 24 shown in drawing 9 is a partial combustion furnace (gasifier) in a garbage gasified melting furnace, It compares, although garbage load is about 1000-2000kg/m²h and the garbage load in the usual fluid bed incinerator is about 450kg/m²h, It is important to secure the aeration pipe interval by which the discharging efficiency of large mass incombustibles is not spoiled, maintaining mobilization uniform [the fluid bed] and good, since it becomes very big garbage load and the rate of the incombustibles in a furnace also increases. Although this embodiment explains the fluidized bed furnace which burns a municipal solid waste, industrial waste, etc., of course, it is also possible to apply the aeration pipe type air distribution machine arranged in the shape of staggered arrangement to other fluidized bed furnaces.

[0016]Drawing 10 shows the aeration pipe type air distribution machine of the fluidized bed furnace by the 4th gestalt of operation of this invention. In the aeration pipe type air distribution machine which formed the wear preventive plate, this embodiment allocates an aeration pipe in two or more steps (two steps of upper and lower sides as [Drawing 10] an example) of upper and lower sides in the shape of staggered arrangement. As shown in drawing 10, the aeration pipe 22 which established the air blowout hole 12 in the main part 10 of an aeration pipe, and attached the wear preventive plate 20 is allocated by

two or more steps (two steps of upper and lower sides as [Drawing 10] an example) of upper and lower sides in the shape of staggered arrangement into the bed material in the fluidized bed furnace 24. As composition of an aeration pipe, the thing of composition of being shown in drawing 1, drawing 2, drawing 4 - drawing 8 is preferred. Other composition, operations, etc. are the same as that of the case of the 1st, 2nd, and 3rd gestalt of operation.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is an expanded sectional view showing an example of the aeration pipe type air distribution machine of the fluidized bed furnace by the 1st gestalt of operation of this invention.

[Drawing 2]It is a side view of the aeration pipe shown in drawing 1.

[Drawing 3]It is an outline lineblock diagram showing the entire configuration of the fluidized bed furnace using the aeration pipe type air distribution machine in the 1st gestalt of operation of this invention.

[Drawing 4]It is an expanded sectional view showing other examples of the aeration pipe type air distribution machine of the fluidized bed furnace by the 1st gestalt of operation of this invention.

[Drawing 5]It is an expanded sectional view showing the example of further others of the aeration pipe type air distribution machine of the fluidized bed furnace by the 1st gestalt of operation of this invention.

[Drawing 6]It is an expanded sectional view showing an example of the aeration pipe type air distribution machine of the fluidized bed furnace by the 2nd gestalt of operation of this invention.

[Drawing 7]It is an expanded sectional view showing other examples of the aeration pipe type air distribution machine of the fluidized bed furnace by the 2nd gestalt of operation of this invention.

[Drawing 8]It is an expanded sectional view showing the example of further others of the aeration pipe type air distribution machine of the fluidized bed furnace by the 2nd gestalt of operation of this invention.

[Drawing 9]It is an outline lineblock diagram showing the circumference of the aeration pipe type air distribution machine of the fluidized bed furnace by the 3rd gestalt of operation of this invention.

[Drawing 10]It is an outline lineblock diagram showing the circumference of the aeration pipe type air distribution machine of the fluidized bed furnace by the 4th gestalt of operation of this invention.

[Drawing 11]It is an expanded sectional view showing an example of the aeration pipe type air distribution machine of the conventional fluidized bed furnace.

[Drawing 12]It is an expanded sectional view showing other examples of the aeration pipe type air distribution machine of the conventional fluidized bed furnace.

[Drawing 13]It is a side view of the aeration pipe shown in drawing 12.

[Description of Notations]

10 The main part of an aeration pipe

12 Air blowout hole

14 Bed material

16 Stagnation member

18 The stillness layer of a bed material

20, 20a, 20b, 20c, and 20d Wear preventive plate

22 Aeration pipe

24 Fluidized bed furnace

26 Fluid bed

28 Packed bed
30 Discharge machine
32 Classifier

[Translation done.]

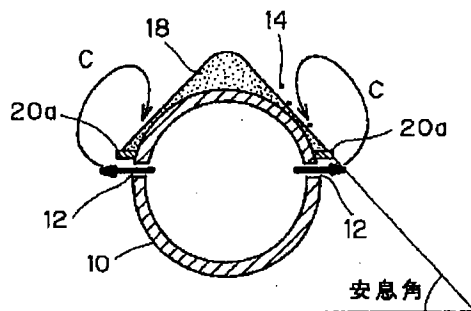
* NOTICES *

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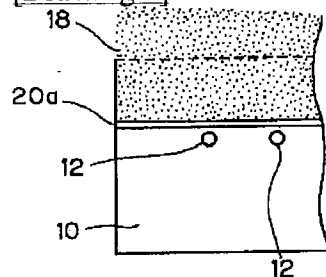
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DRAWINGS

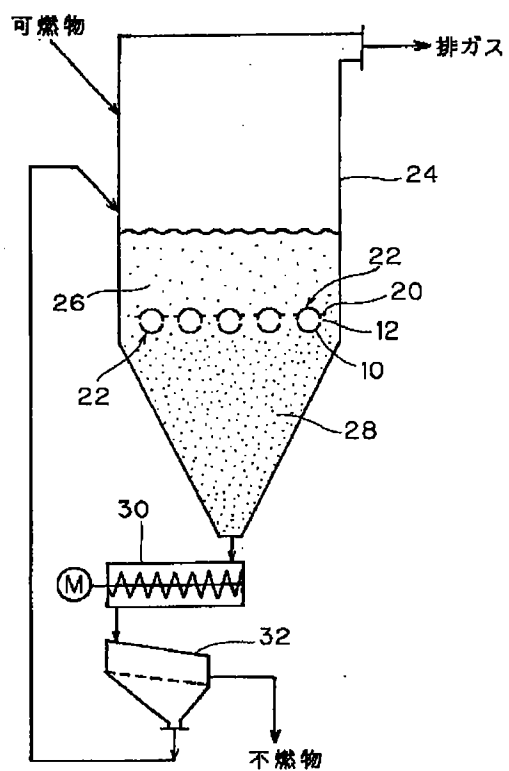
[Drawing 1]



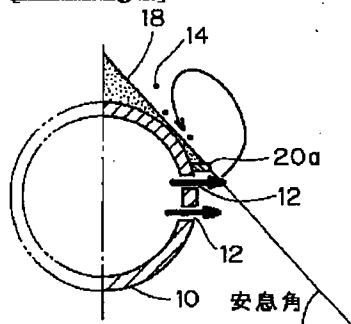
[Drawing 2]



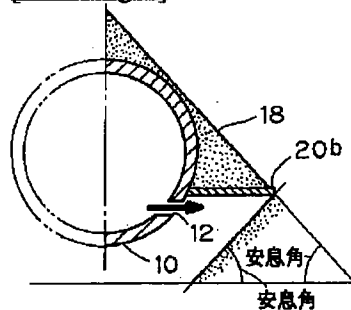
[Drawing 3]



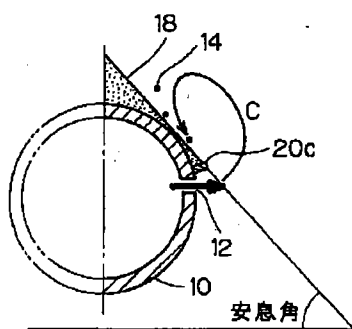
[Drawing 4]



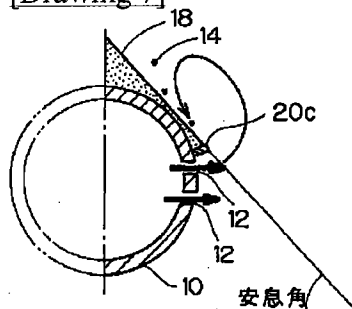
[Drawing 5]



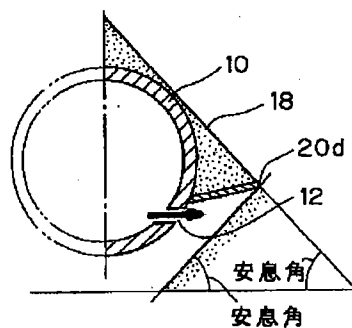
[Drawing 6]



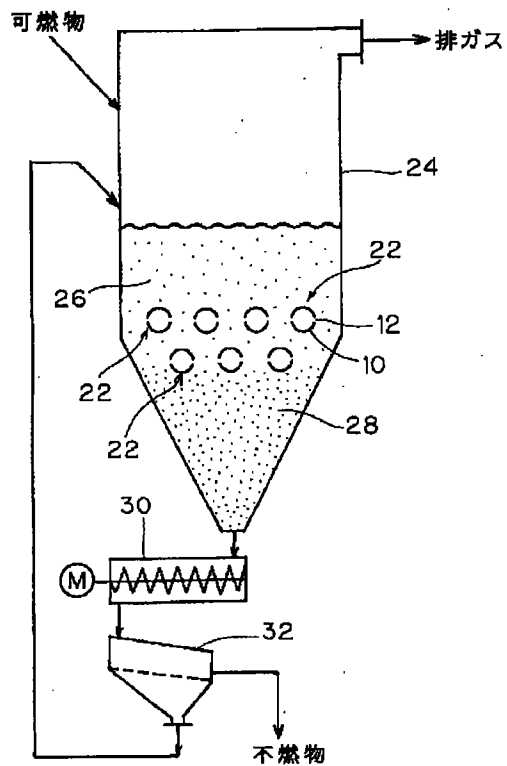
[Drawing 7]



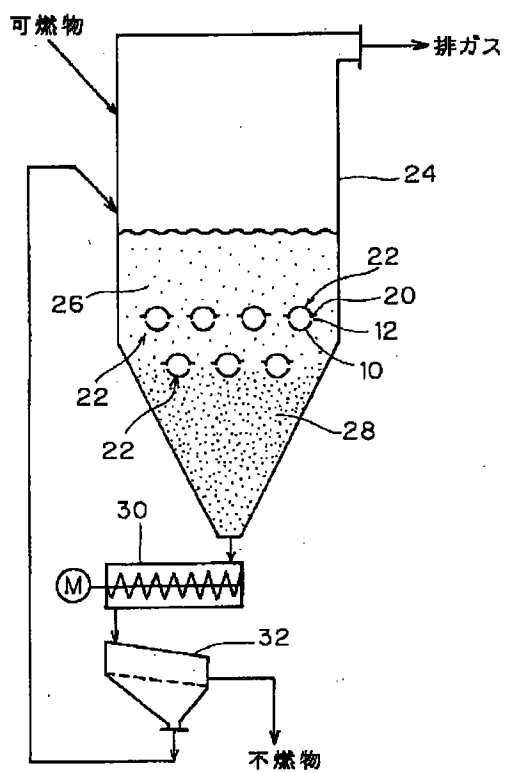
[Drawing 8]



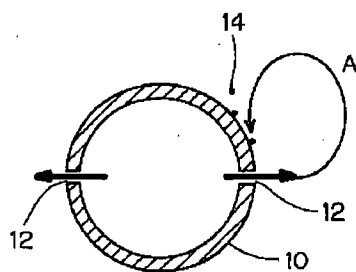
[Drawing 9]



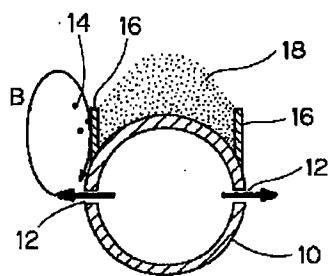
[Drawing 10]



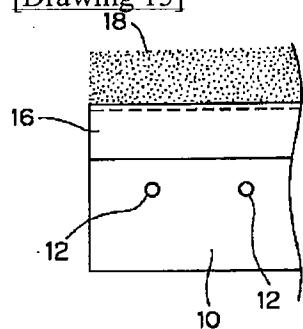
[Drawing 11]



[Drawing 12]



[Drawing 13]



[Translation done.]

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WRITTEN AMENDMENT

----- [A written amendment]

[Filing date]February 15, Heisei 11

[The amendment 1]

[Document to be Amended]Specification

[Item(s) to be Amended]Claim 2

[Method of Amendment]Change

[Proposed Amendment]

[Claim 2]As if the fluid bed for making the air distribution machine upper part which consists of two or more aeration pipes mobilize a bed material and combustibles is formed, both, After making an aeration pipe array pitch large in a fluidized bed furnace which formed in the air distribution machine bottom a packed bed of a bed material and incombustibles which descend from said fluid bed so that large mass incombustibles may pass, An aeration pipe type air distribution machine of a fluidized bed furnace characterized by allocating an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement so that mobilization of a bed material and combustibles may become uniform.

[The amendment 2]

[Document to be Amended]Specification

[Item(s) to be Amended]0008

[Method of Amendment]Change

[Proposed Amendment]

[0008]The aeration pipe type air distribution machine of the fluidized bed furnace of this invention, As if the fluid bed for making the air distribution machine upper part which consists of two or more aeration pipes mobilize a bed material and combustibles is formed, both, After making an aeration pipe array pitch large in the fluidized bed furnace which formed in the air distribution machine bottom the packed bed of the bed material and incombustibles which descend from said fluid bed so that large mass incombustibles may pass, It is characterized by allocating an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement so that mobilization of a bed material and combustibles may become uniform (refer to drawing 9). Mobilization uniform [the fluid bed] and good is realizable, securing the aeration pipe interval through which large mass incombustibles pass by arranging an aeration pipe in the shape of staggered arrangement to two or more steps (for example, two steps of upper and lower sides) of upper and lower sides. The details are mentioned later. In the aeration pipe type air distribution machine which formed the above-mentioned wear preventive plate, it can also have composition which allocates an aeration pipe in two or more steps of upper and lower sides in the shape of staggered arrangement (refer to drawing 10).

[Translation done.]